

## **Appendix A: About Classrooms for the Future**

This Appendix discusses many fundamental aspects of the CFF initiative. It discusses the language the administration uses to promote the program, the warrant (reason) behind the program, how the ‘message’ that goes along with the implementation of CFF is being diffused to the classroom level, and it shines the spotlight on two pivotal actors involved in the initiative: the CFF Coach and District Technology Directors.

### ***Why and how was CFF created?***

Secretary of Education Gerald Zahorchak (2007) states, “A quality telecommunications infrastructure is vital for schools in today’s globally competitive economy. However, too many of our rural and disadvantaged schools lack access to the high-speed technology that’s necessary for students to succeed” (p.1) To remedy this, “Governor Rendell signed the landmark Act 183 in 2004, establishing the E-Fund to help school districts without access to high-speed Internet purchase quality broadband access and service “ (Zahorchak, 2007, p.1). Part of the funds from Act 183 were utilized in creating the program Classrooms for the Future, which is meant to reform high school teaching, to address teaching and learning to create intelligent and skilled learners in “the new millennium” (Zahorchack, 2007, p.1).

The purpose of the Classroom for the Future (CFF initiative is to transform Pennsylvania’s high schools, making them more engaging and more responsive to the economic challenges presented by globalization. This high school reform initiative is at the same time an effort to enhance teaching and learning, to promote access to technology and the effective use of that technology, and to increase our ability to compete in an increasingly competitive marketplace. As such this reform initiative targets increasing the number of powerful computers available for student use (a laptop computer on every student desk in every public high school classroom in which the four core subject areas are taught) and the professional development of teachers (a multimedia teaching station in each classroom and the preparation required to use these technologies well).

CFF leaders believe that by adding technology access for students and teachers and by making a significant commitment to the professional preparation of teachers to use these resources well, this initiative changes teaching methods, improves student interest and engagement, and improves learning of academic content and the development of 21st Century skills. On September 20, 2006, Governor Edward G. Rendell proposed that, “Classrooms for the Future will not only help to boost success in college and beyond, especially in fields that require advanced skills with computers and technology” (Rendell, 2006). Further, Governor Rendell proposed that measures of statewide technology access and use, such as those offered by Education Week (Technology Counts, 2006), will reflect the change and that more importantly, “this initiative is about enhancing our

schools' learning environment, increasing student achievement and preparing our students to compete in the global job market.”


Pennsylvania is not the first to move its schools in this direction. Former Maine Governor Angus King, in describing the Maine's initiative that put laptop computers in the hands of all middle school students in the state, said, “In my 30 years of working on Maine economic issues, no idea has had as much potential for leapfrogging the other states and putting Maine in a position of national leadership as this one—giving our students portable, Internet –ready computers as a basic tool for learning” (Curtis, 2004a). CFF was created to improve the access to technology and improve some troubling statistics. According to Pennsylvania's Secretary of Education, before CFF the Commonwealth was ranked 37th in the nation for the number of teachers who use the Internet in classroom instructions. In the “Technology Counts 2006 “ report, Education Week gave Pennsylvania a “C” for its lack of access to, and incorporation of, technology in schools” (Phillip and McDonald, 2006, pg. 2)<sup>1</sup>.

Prior to CFF there had been many advocates for the use of technology-rich approaches to education. For example, Bette Manchester, Director of Special Projects for the Maine Department of Education, including the Maine Technology Initiative remarks, “if people are really serious about school reform and leveling the playing field, raising the bar for all kids, these are tools that can really support change” (Curtis, 2004b). Bonifaz and Zucker (2004) describe, “policymakers' goals for laptop initiatives include increasing economic competitiveness, reducing inequities in access to computers and information between students from wealthy and poor families, and raising student achievement through specific interventions, such as improving students' understanding of algebra through the use education software” (p.3).

Changing education to meet the needs of contemporary society is at the heart of Classrooms for the Future. Golden (2006) discusses Pennsylvania's Classrooms for the Future program. In discussing change, he says, “As in the past ages distinguished by a major economic shift, the current educational system bears the responsibility of preparing a new generation for a changing workforce. Where the move was from agricultural to industrial, and then from industrial to technological, the great transition now is from local technology to global information” (Golden, 2006, p. 26).

Throughout the first two years of implementation of the program, these messages have diffused to actors at the district and state levels. Technology directors and principals identified the need for change in the way teachers teach and change in the way that students learn as reasons for the CFF program. In interviews with project managers they added that the creation of CFF was a State initiative to put a laptop computer in every

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<sup>1</sup> In 2008, Pennsylvania received an overall technology scores of 81.8 (B-), including a 86.3 score on the Access to Technology item. Nonetheless, since Education Week bases their technology scores on 4<sup>th</sup> and 8<sup>th</sup> grade data, it is difficult to say whether or not this is attributable to Classrooms for the Future, or to the overall Technology agenda of the Rendell administration. 

high school English, math, science and social studies classroom. In addition one highlighted it as a reform movement saying, “The Classrooms for the Future, for me and my school district, is truly about high school reform and reforming the way our teachers and students work with the curriculum and how they incorporate the curriculum in their teaching. One of the things we really placed an emphasis on here is that the grant is not about the technology per se. It’s about having the technology as a tool to change the way the teaching and learning is happening, so that we can more easily change that 21st Century learning environment that our students really strive for.”

In summary, Classrooms for the Future is designed as a technology initiative that includes not only the technology, but also the pedagogical application of technology in instruction. At its core, Classrooms for the Future is a comprehensive high school reform initiative. Students entering the workplace and higher education are expected to be knowledgeable enough to research assignments and solve problems utilizing dynamic technological tools. Classrooms for the Future aims to address those skills necessary to achieve those goals.

### ***What is CFF?***

To respond to this question, it is important to succinctly document the existing ideas surrounding technology rich learning environments incorporated into high school reform initiatives. By describing and citing the existing research base available prior to the implementation of CFF, we hope to draw out the ideas behind the movement. Second, in this section we strive to document some of the core pillars to this high school reform initiative, including it’s comprehensive programs aimed at fostering teacher professional development and efforts to change the culture of teaching and learning in Pennsylvania’s high schools.

Classrooms for the Future is a program designed for making students more active learners while in school and prepared to use technology and problem solving skills necessary to enter the workplace or higher education. Using “smart classrooms and laptop computers for students and teachers” high school classrooms will be reformed to help students be prepared to work, learn, and live in a technology driven world (Jobe, 2007, p.1). Instructional improvement occurs through “job-embedded, just-in time professional development” along with “instructional technology coaches” providing “resources, assistance with lesson planning, and modeling for the participating teachers (Jobe, 2007, p.1).

Northeast and the Islands Regional Technology in Education Consortium (NEIRTEC) attempted to guide one-to-one computing initiatives in many states (i.e. Maine, Indiana, Michigan, New Hampshire, New Mexico, Texas, and Vermont). In explaining laptop initiatives Bonifaz and Zucker (2004) say, “Ubiquitous or one-to-one computing environments are different from what one traditionally finds in most school settings because they offer all students and teachers continuous access to a wide range of software, electronic documents, the Internet, and other digital resources for teaching and

learning” (p.3). Five areas identified by NEIRTEC for laptop initiatives to be successful include: planning, training and professional development, managing change, and monitoring and evaluation (Bonifaz & Zucker, 2004, p.3). In planning, NEIRTEC recommended aligning planning with the goals of the program which connects with districts writing up how the technology from Classrooms for the Future will be used when applying for the grant (Bonifaz & Zucker, 2004, p.4).

In getting the most out of planning, Bonifaz and Zucker (2004) recommend: aligning the laptop initiative with district goals, building a strong leadership team at all levels (meeting regularly), thinking about funding for the long term, develop solid partnerships both inside and outside the school, and plan logistical details carefully (pp.4-6). Training and professional development according to Bonifaz and Zucker (2004) involves teachers and administrators learning about “curriculum integration, not only on technical skills” (p. 7). It also incorporates parents understanding and having access to resource centers (Bonifaz and Zucker, 2004).

In supporting NEIRTEC guidelines, Bonifaz and Zucker (2004) describe that training and professional development involves: “assessing the technical and professional development needs of school staff, forming a “Technology Leadership Team,” using a variety of training and professional development formats, partnering with local universities, educational organizations, and other institutions, providing administrator professional development, and making professional development flexible” (Bonifaz and Zucker, 2004, pp.7-8).

Suggestions for hardware and software by Bonifaz and Zucker (2004) are: “provide the necessary digital content and tools,” “build and maintain the necessary network infrastructure,” “and make technology support available onsite as well as offsite” (pp.8-10). Providing necessary digital content and tools means purchasing appropriate licenses and materials, creating e-learning curriculum, and identifying “software needs and restrictions” (Bonifaz & Zucker, 2004, p. 9). Build and maintain the necessary network infrastructure as described by Bonifaz and Zucker (2004) incorporate three ideas: assessing the infrastructure and wiring needs within the school, supporting and maintaining networks, and consider purchasing display devices.

Bonifaz and Zucker (2004) talk about managing change. They discuss allowing “sufficient time for change and make it gradual” (Bonifaz & Zucker, 2004, p. 10). Part of change is teachers becoming comfortable with the technology before incorporating it into instruction, providing students with keyboarding skills, and understanding change has to be gradual (Bonifaz & Zucker, 2004, P.10).

Finally monitoring and evaluation as explained by Bonifaz and Zucker (2004) describes how monitoring is ongoing and research or evaluation need to be done based on “critical influences at multiple levels of the education system” and figuring out what is to be taught and then measure it (pp. 11-12).”

According to Education Department spokeswoman Sheila Ballen, “Pennsylvania’s program [Classrooms for the Future] places special emphasis on training teachers to use the technology and know how to incorporate it into their lesson plans” (Raffaele, 2007). An example of the coach and teacher connection is seen with Robin Bober, a business and computer science teacher who is a school district coach who helped Doug Perry, a science teacher, design a lesson using a “laptop, projector and Smart Board-- a computerized version of a blackboard for which the grant also paid -- to display a PowerPoint on a lesson about dinosaurs and fossils” (Pauling, 2008).

Classrooms for the Future attempts to take technology and apply those items with strategies to create a learning environment that best addresses the needs of learners while developing their global knowledge and skills. Classrooms for the Future is an initiative meant to reform high school education based on planning, training and professional development, managing change, and monitoring and evaluation. The program is designed as collaboration meant to change teaching and learning rather than simply be one more tool to use in the classroom.

The messages of what is CFF has diffused among many actors at the district level. Three main themes emerged in interviews with principals, project managers and technology directors when asked, “What is the Classrooms for the Future program about?” They reported that the program was:

- A way of changing the instructional process,
- To increase technology in the classroom, and
- Engaging students in the learning process with 21st century skills.

One principal focused on the changes that occur with CFF, saying, “It’s way more than just technology. It is giving teachers the resources and tools to get students to the next level. It’s all about giving the kids opportunities to outside resources, new ways to interact with each other. It has really changed how we do things in the classroom. Things are more project oriented, using a lot more outside agencies, more outside resources we wouldn’t have been able to choose.”

Those interviewed described CFF as exposing students to different ways of learning, providing teachers with different tools, sharing activities with their students, and providing more engagement for the students to develop 21st Century technology-literate students. Technology directors described CFF as a means of empowering students with an environment that uses technology and 21st century skills, moving to a more student-centered classroom. One described CFF as, “creating 21st century learning environments; putting the tool sets in the hands of the teacher and offering the students the technology they demand today to match their own learning styles. It is about transformation of high school learning atmosphere--continuous improvement.”

Reviewing a thickly documented and researched educational agenda and incorporating existing best practices in the field of high school education reform, Pennsylvania policy

makers constructed a multi-layered program that targets reform. In doing so, policy makers strived to construct an evidence base surrounding the CFF program (of which this evaluation is a part), integrate a comprehensive professional development program which stands on two pillars: a innovative coaching initiative and online professional development for teachers. Furthermore, the framework of the CFF program includes information sessions for administrative leaders throughout the state for purposes of community building around the program and diffusing such important information as program details and requirements which are supported by a variety of online technologies including list serves and the CFF website located at the PDE Ed Hub: <http://www.edportal.ed.state.pa.us>

### ***The CFF Year Two Implementation Timetable***

In the first year of the CFF program, within the 2006-2007 budget, Governor Rendell committed \$20 million dollars to Classrooms for the Future (Philips & McDonald, 2007, p.1). In that first year 103 schools in 79 districts were selected to be part of the initial wave of the program (Barnes, 2006). Over the next three years, \$200 million was to have been allocated so that every high school in Pennsylvania would have an opportunity to participate (Philips & McDonald, 2006). Barnes (2006) discusses Governor Rendell's proposal to, "equip public high school classrooms in each district by 2009 with laptop computers on the desk of each student and to train teachers in how to use the technology to boost learning" (p. 1). Classrooms for the Future is the program Governor Rendell "hopes to expand to \$90 million in each of the next two years" in order "to put computers and teacher technology workstations on the desks of all math, science, English and social studies classrooms in Pennsylvania" (Hardy, 2006). Governor Rendell is quoted as saying, "Classrooms for the Future will not only help to boost achievement while our students are still in high school, but they will be primed for success in college and beyond, especially in fields that require advanced skills with computers and technology" (Philips & McDonald, 2006, p.1).

Within the first year, the average amount of money per district participating was \$252,000 equating to funding for 35,000 laptops (Philips & McDonald, 2006). Grants are normally available and due in the spring before the academic year (Jobe, 2007). State reformulated allocation of Classrooms for the Future grant to adjust to planning of use of the grant by districts and to help more adequately fund districts that are in their second year of the program by providing at least the minimum amount necessary to keep the programs going (Pauling, September 15, 2007).

According to the Pennsylvania Department of Education, "more than 356,000 students will benefit from 6,500 well-trained teachers and access to 100,000 laptops in English, Math, Science, and Social Studies classrooms by the end of the 07-08 school year" (PDE, 2007). The 2007-08 state funding for the program consisted of \$90 million for equipment and \$20 million for teacher training and support. Throughout Year Two, our

data collection-monitoring tool tracked the participation of 6810 teachers in the surveys, as well as district level compliance with teacher observations and implementation tracking requirements.

There are 6810 teachers whose classrooms are involved in CFF in Year Two. This represents over 350 schools spanning the whole state. The specific timetable for implementation varies by district. Their responses ranged from October (7%), November (11%), December (14%), to a high in January (43%), and tapering off in February (7%). Some (18%) directors did not indicate specific dates but responses ranged from when they received the equipment or a range of time, as in September to March. The implementation was dependent on when they received the equipment and the amount of time it took to get the computers ready, from about a month to a month and a half.

The primary causes of implementation delays were the equipment, network issues and scheduling. Although 24% of the responses by technology directors interviewed reported no issues with the implementation, others described network (27%) and technical (15%) problems as the biggest issues. They also commented on delays due to scheduling the training sessions (9%). One mentioned that, "Trying to group school districts in a region together with the same training was difficult because school districts are at different levels and at different points in their implementation process." The responses from the project managers' viewpoint were that equipment that did not work (27%) and a delay in receiving the equipment (24%) as the biggest issues with the implementation.

When asked what technology problems limited the program's impact, the majority (39%) of the technology directors reported none. There were, however, concerns about wireless (16%) and the slowness of the Lenovo laptops (26%). When they reimaged the laptops with only the programs they needed, the computers worked much better. They noted that they would prefer to image the laptops themselves.

### ***The Role of the Coach in Classrooms for the Future***

According to the principals, project managers and technology directors interviewed, the coaches are critical to the success of the program. Words describing the coach in the interviews included: invaluable, outstanding, indispensable, instrumental, catalyst, and resource, critical. One project manager explained the coach's role, saying, "The coach is the success of all of this. Having a coach who is a teacher is the ideal experience because they are the ones on the front edge; they are on the cutting edge of integrating this technology into the lessons. And then they serve as a model for other teachers as well as the facilitator of other teachers to try different instructional processes. So the coach has been crucial to all of this."

Having classroom teachers take on the role of a coach in the Classrooms for the Future program has had a significant impact on instruction, helping to change the knowledge, skills, and attitudes of the teachers and the students in the learning process. Coaches and

teachers worked collaboratively in the program with the coach modeling what the teachers were learning in the professional development activities.

An important role for the coaches was to support the teachers one-on-one allowing them to try new approaches in teaching they might not have been able to do alone. One project manager said that, “The reason my grant was so successful was that our coach had that designated time to go into the classrooms to work with those teachers one-on-one and to model the technology, to brainstorm, to work with them, and problem-solve.” They were also instrumental in facilitating a learning community of sharing and support. The relationships between the teachers and the coach were mentioned throughout the interviews as being important in sharing ideas and establishing a non-threatening environment. One of those interviewed noted that, “The teachers are energized by the program and sharing their experiences.” Another reported, “Never in my career have I seen any program that has had such impact on student learning. Teachers are on fire, they are collaborating, exploring together, kids are more empowered.”

The interview respondents also believed that the attitudes of the teachers were more positive when they had the coaches available to help them to team teach or get help when they needed it. One of those interviewed noted that the CFF initiative was different from others they had been involved in, saying, “If you’re around schools much you know there are a lot of initiatives and they [the teachers] get tired and say we’ve been through this before. But I haven’t found that with this one. There is acceptance and very positive attitudes.”

The principals interviewed identified the coaches as a “lifeline” for teachers and an integral component of the CFF program. They also viewed the coaches as a valuable liaison between teachers and administrators. They identified working one-on-one with teachers, providing professional development, and encouraging teaching in implementing the technology as the primary responsibilities, with additional factors including being approachable and available, providing technical support, communication, and collaboration/co-teaching.

### ***The Role of the Technology Director in Classrooms for the Future***

The technology directors are important contributors to the success of the Classrooms for the Future Program. They understand the key role that technology plays in achieving the program’s goals and they support the school district personnel in implementing those goals. In interviews with the technology directors they saw the Classrooms for the Future program as about changing teaching and learning and preparing students for the 21st century. The use of technology was secondary but important in bringing about change.

Not surprisingly, the technology directors stated that integrating technology into the curriculum to improve learning was the most noted as the single focus of CFF. However, in their responses the technology directors used words like “collaborative learners,”



“engaging students,” “make the curriculum come alive,” and “reinventing how students learn” to describe the focus of the CFF program.

The technology directors also talked about the team effort among the administrators, teachers and coaches in making the program a success. They often cited the coach as being instrumental in helping the teachers and motivating them. One technology director noted that, “Our coach has been one of the biggest reasons for success. Our whole team has done a good job but our coach has been great. He really gets out there and shows the teachers how to use it.”

Access to technology and sustainability were other key issues for the technology directors. When asked “What problems or issue do you expect the program to solve in your school district?” they most cited that the grant gives students access to technology that they could never afford to give them without it.

What is most revealing is the value the technology directors’ place on the coaches in the CFF program. They cited the coach and the professional development, in addition to the availability of technology, as the most valuable aspects of the program. One technology director said of the coaches, “I think one of the most valuable aspects is the coaches. A lot of grant money programs give you money to buy equipment but don’t give you the personnel to train the people. I think one of the best things that they’ve done is they’ve allowed us to have somebody on staff as a coach to show the teachers how to use the technology.” Another cited their value in supporting teachers, saying, “They are the thinkers who are working with the teachers to solve problems, understanding the values of 21st century learning, they are the advocates. Without the coaches, we would not be successful.”

The technology directors also noted the relationships among teachers has changed. There is more sharing of ideas and resources as well as collaboration in teaching. Teachers have invited coaches and principals into their classroom to showcase what they are doing in the classroom. This “collaborative” theme has occurred throughout the year 2 interviews.

### **Challenges Technology Directors Face in the Implementation of CFF**

The primary responsibility for the technology implementation and support for the program has fallen on the shoulders of the technology directors. Interviews with technology directors have provided useful feedback in understanding the needs of the schools in preparing for district-wide changes utilizing technology across many areas including infrastructure, personnel, students, and other stakeholders.

One of the most cited challenges of the CFF program for the technology directors has been making sure that the district infrastructure can support the technology needs. One technology director compared it to putting 21st century technology into 19th century classrooms in his district. For many technology directors wireless capability was a major issue in terms of bandwidth, connection issues with laptops and printers, and ongoing

maintenance of the system. There were ancillary needs in terms of wiring and switches as well as additional access points for the laptops. Not all districts had issues with their infrastructure; some technology directors reported that they had invested in their infrastructure over the years and were able to support the new technology.

Technology directors also cited getting the teachers to buy-in and to actually use the technology as a challenge. They noted some resistance to the program initially and the importance of making sure the technology worked properly to ensure that teachers would not give up when they encountered a problem. Some noted that it was more difficult getting the newer teachers to use the technology. They reported that the more senior teachers seemed to embrace the initiative. One technology director said, “It is easy to get the technology but to alter instructional methods is most difficult.”

Technology Directors’ consistently maintained that CFF Coaches help teachers overcome their resistance to technology and/or new high school reform initiatives. The technology directors consistently reported that the coaches were necessary to provide that just in time support that teachers need. One described the coaches importance in saying, “This program would not work without the coach. They provided excellent training to the coach so that the coach was an asset to me. I did not have to hold the coaches hand. It was beneficial that the coach was a teacher. It was taken well that the coach was one of their peers--someone who had some combat experience. It was so good that we are going to look into funding that coach full time.”

Technology directors were split in response to the question about whether CFF put any stresses on district personnel--nearly a third of the responses were that more technology staff were needed and an equal number responded that it did not put any stress on personnel. Many technology directors cited a stress on their staff, one saying that, “I have the same number of people I did before this was implemented. The coach picks up some of that. CFF people can be very needy, there are technical issues that are beyond the realm of the coach.” In one instance a school had to hire another staff member to help with the addition of almost 1,000 laptops being implemented. The burden for the staff is primarily in the initial implementation and thereafter in keeping up with all the issues that come up with a large initiative.

One of the main issues reported by many of the technology directors was in the disk image that came with the laptop. The laptops were slow to start up, wasting valuable class time. One director said, “We had a lot of computers to image. We didn’t go with the State image. We ordered it so we had to re-image all the computers. It was a strain on our technicians but we have a good staff that was able to meet the needs.”

The majority of technology directors did not report any technology problems that limited the program’s impact. Some did mention, however, that there were start-up costs associated with the program that were not anticipated and put a burden on the school to provide—upgrades to servers and wireless capability and increased bandwidth. Many also found that the memory on the computers was not adequate for their needs and they had to allocate funds for additional memory.

One of the single biggest issues reported by the technology directors was that the laptops were slow to boot and required their limited technical support staff to reimage the laptops. The “Lenovo laptops were a disaster,” reported one technology director. Others cited frustration with all the programs that were running on the laptop. This issue was briefly noted in the staffing issues section requiring many hours of time by the technical support team to reimage the laptops. There were also comments about the Apple laptops’ image and the need for greater flexibility in allowing school districts to modify the image. Another problem that was reported was setting up the interactive whiteboard. In some buildings it was difficult locate them in the classroom without creating a hazard. There were also a few issues with brackets breaking and using USB power to the whiteboards.

### **Advice for Technology Directors Leading the Next Wave of CFF**

The technology directors cited the following areas to focus on in implementing the Classrooms for the Future initiative:

- Develop teams to implement the program
- Immerse yourself in state and district activities relating to the CFF program
- Add funds in the budget for continuation of the program
- Be well organized and plan ahead
- Communicate well and be sure everyone is informed
- Prepare network in advance
- Choose the coach wisely

When asked what they would do differently next year the technology directors most often noted: better plan implementation, additional training and professional development opportunities, and expand and improve capability.